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ABSTRACT

Using the alternate forms A and B of the Watson-Barker Listening Test (WBLT), a study compared total scores and sub-scores for the audio versus the pilot video format, pre- versus post-instruction, and males versus females. Subjects consisted of 183 males and 292 females in a succession of upper-division college classes on listening at a metropolitan university in the Pacific Northwest. The WBLT assesses five types of listening: the ability to evaluate message content using short term listening (STL); the ability to understand meaning in conversations using STL; the ability to understand and remember information in lectures using long term listening (LTL); the ability to evaluate emotional meanings in messages using STL; and the ability to follow instructions and directions using LTL. Form B of the test, both audio and pilot version, was an alternate form test to Form A, with the same format but different questions. Results indicated video format subjects had two higher sub-test scores and higher total score pre-instruction but not post-instruction. Subjects scored higher on the post-instruction tests except for one sub-test (following instructions and directions), and females scored higher than males on one pre-instruction sub-test, two post-instruction sub-tests, and on post-instruction total score. Alternate-form correlations were low, but statistically significant. Findings indicate that the WBLT is an easy to administer and effective tool for measuring skill improvement separate from academic learning. (MM)

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A COMPARISON OF THE AUDIO AND PILOT VIDEO VERSIONS OF THE WATSON-BARKER LISTENING TEST: FORMS A AND B

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Abstract

The Watson-Barker Listening Test: Forms A and B assesses five types of listening. Using the alternate forms, this study sompared total scores and sub-scores for the audio versus the pilot video format, pre- versus post-instruction, and males (183) versus females (292) in a succession of upper-division college classes on listening. Statistically significant results ($p < .05$) were as follows: (a) Video format subjects had two higher sub-test scores and higher total score pre-instruction but not post-instruction; (b) Subjects scored higher on the post-instruction test except for one sub-test (following instructions and directions); and (c) Females scored higher on one pre-instruction sub-test, two post-instruction sub-tests, and on post-instruction total score. Alternate-form correlations were low, but statistically significant. The Watson-Barker Listening Test provides teachers and students with an easy to administer and effective assessment tool for measuring skill improvement separate from academic learning.

Acknowledgment

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Although listening is accepted as one of the four basic communication skills (reading, writing, speaking, and listening), college-level communication programs have been slow to offer specific listening courses. We offered our first course on listening summer quarter 1984. To determine if students were benefiting from our instruction, we decided to use a listening test. We needed an objective measure of listening skills separate from general knowledge acquired about listening.

After reviewing several listening tests including the *Dow Comprehensive Listening Test* (1955), the *Brown-Carlson Listening Comprehension Test* (1955), the *Xerox Learning Systems* (1977), and the *Kentucky Comprehensive Listening Skills Test* (1983), we selected the *Watson-Barker Listening Test* (1983). The Watson-Barker Listening Test (WBLT) was manageable in a 50-minute class period, was appropriate for college level students, had been standardized for college students, and had clear instructions for administration of the test and for taking the test.

The initial form of the WBLT was on audiotape. Following their development of a pilot video version of the listening test (summer quarter 1987), Watson and Barker provided us with a copy. In a study by Nelson & Moll (1951) comparing the audio and video elements of instructional films, they found that using both audio and visual channels together was more effective than using either one alone. Since past listening tests used only the auditory modality in testing listening comprehension, we made the following assumptions:

1. The pilot video version of the WBLT, Forms A and B would be easier to administer than the audio version of the same test.

2. Students would obtain higher total scores using the pilot video version (video) of the WBLT because of the added modality.

3. Students would obtain higher scores on the pilot video version of the WBLT than on the audio version on sub-tests 1, 2, 3, 4, and 5, of Form A and Form B.

4. At the end of a course in listening, students would obtain scores which were significantly higher on Form B of the WBLT than they scored on Form A for both total score and sub-tests 1, 2, 3, 4, and 5.

Our final assumption, based on previous findings of Watson & Barker, was:

5. Females would attain higher scores on Form A and B of both the audio and pilot video version than males on sub-tests 1, 2, 3, 4, and 5 and on total score.

Method

Subjects

The subjects in this study were 475 (183 male, 292 female) students in the upper-division course, Listening, at a large metropolitan university in the Pacific Northwest. The course was offered during consecutive quarters between June 1984 and July 1988.

Materials

Materials for the audio version included the cassette taped test, an audio tape machine, a test booklet for each subject, a half-sheet of plain paper to cover up subsequent answers, an answer sheet, and a pen or pencil. The video version required a video playback unit and one or more 25" color monitors, an answer sheet, and a pen or pencil.

Form A of the Watson-Barker Listening Test, either the audio or the pilot video version, was composed of five sub-tests labeled Forms one through five:

Part 1 tested the ability to evaluate message content using short term listening (STL). "Based on principles of memory, short-term listening lasts up to fifteen seconds" (Watson & Barker, 1988).

Part 2 tested the ability to understand meaning in conversations using STL.

Part 3 tested the ability to understand and remember information in lectures using long term listening (LTL). "Long-term listening . . . is not activated until at least one minute after the presentation" (Watson & Barker, 1988).

Part 4 tested the ability to evaluate emotional meanings in messages using STL.

Part 5 tested the ability to follow instructions and directions using LTL.

Each sub-test consisted of ten questions for a total of fifty answers. Subjects counted the total correct for each sub-test, doubled that sub-total and combined all sub-scores to arrive at one total score for a maximum possible of 100.

Form B of the listening test, both audio and pilot video version, was an alternate form test to Form A, which had the same format but different questions.

Procedure

The two modes of presentation and the availability of sub-scores established three groups of subjects. Group 1 included 91 students (36 male, 55 female) using the audio version and with recorded sub-scores; Group 2 included 94 students (46 male, 48 female) with audio version but without sub-scores; and Group 3 included 290 students (101 male, 189 female) using the video version and with recorded sub-scores.

All audio students (n = 185) were taught by one male instructor, while the video students were taught by the same male instructor (n = 100), and a female instructor (n = 190).

The start of both the audio and video tapes included instructions regarding adjusting the sound levels of the playback unit and, in the video version, for sitting where the students could read the words on the video screen. Time was allotted to make necessary adjustments. For both versions a narrator gave specific instructions for each of the sub-tests at the start of each sub-test. Both versions included short role-playing scenes presented by actors. The video version presented the same dialogue or narrative as the audio version, but added the visual effect of the person or persons speaking. None of the actors reinforced the verbal information by acting out the information presented. Following each scene, the audio version students read a multiple choice question from a booklet, whereas the video version questions appeared on the monitor screen. Both versions allowed an average of eighteen seconds to select an answer, and each topic or role-played scene had a range of one to four questions asked about the scene.

Independent variables included in this study were instructor, sex of subject, and mode of presentation.

The dependent variables used in this study were the corresponding scores for Form A and Form B, e.g., sub-score for Part 1 in the first test (A) and sub-score for Part 1 in the second test (B), etc., and the total score for Form A and for Form B.

The administration of the WBLT, Form A, was usually given the fourth or fifth class hour during a quarter term. Form B of the test was given the next to the last week of classes before the final examination period. This schedule allowed an average of seven weeks between the first and second administration of the listening test. In keeping with classroom administration in the original Watson-Barker study, students were not graded on individual scores nor was their course grade based on their WBLT score. Students did receive course credit for completing Form A and B.

Results

We compared the audio students' (Groups 1 and 2) mean total score for Form A with the video students' (Group 3) mean total score for

Form A. The results showed that video students scored significantly higher than audio students. The difference was 2.74. The difference between audio and video for Form B was not significant. The results are presented in Table 1.

Table 1

Comparison of Audio and Video Means for Form A and Form B

Group	*N*	Mean	*SD*
		Total Score Form A	
Audio(Gp 1&2)	185	59.36	9.57
Video	290	62.10	9.69
Pooled variances	$t = -3.02$	$df = 473$	$p = .003$
		Total Score Form B	
Audio(Gp 1&2)	185	72.30	10.10
Video	290	70.90	9.41
Pooled variances	$t = 1.54$	$df = 473$	$p = .123$

We compared the audio mean scores for Form A sub-tests 1, 2, 3, 4, and 5, and Form B sub-tests 1, 2, 3, 4, and 5 with the video mean scores for Form A sub-tests 1, 2, 3, 4, and 5, and Form B sub-tests 1, 2, 3, 4, and 5. The results for Form A sub-tests showed that the mean for video (Group 3) was significantly higher than the mean for audio (Group 1) on sub-tests 4 and 5. The difference on sub-test 4 was 1.10, and on sub-test 5 was 1.75. The corresponding means for sub-tests 1, 2, and 3 did not differ significantly. See Table 2.

Table 2

Comparison of Audio and Video Sub-test Means for Form A

Group	*n*	Mean	*SD*
		Sub-test 1A	
Audio(Gp 1)	91	10.53	3.90
Video	290	10.95	3.29
Pooled variances	$t = -1.02$	$df = 379$	$p = .306$
		Sub-test 2A	
Audio(Gp 1)	91	9.06	3.09
Video	290	8.93	3.04
Pooled variances	$t = .34$	$df = 379$	$p = .735$
		Sub-test 3A	
Audio(Gp 1)	91	11.82	3.72
Video	290	12.60	4.04
Pooled variances	$t = -1.63$	$df = 379$	$p = .104$
		Sub-test 4A	
Audio(Gp 1)	91	13.71	3.05
Video	290	14.81	2.94
Pooled variances	$t = -3.07$	$df = 379$	$p = .002$
		Sub-test 5A	
Audio(Gp 1)	91	12.90	3.47
Video	290	14.65	3.26
Pooled variances	$t = -4.40$	$df = 379$	$p = .000$

The results for Form B sub-tests showed that there were no significant differences between corresponding sub-test means for audio sub-scores and video sub-scores. See Table 3.

Table 3

Comparison of Audio and Video Sub-test Means for Form B

Group	*n*	Mean	*SD*
		Sub-test 1B	
Audio(Gp 1)	91	13.06	3.82
Video	290	12.43	3.71
Pooled variances	$t = 1.40$	$df = 379$	$p = .162$
		Sub-test 2B	
Audio(Gp 1)	91	12.53	3.18
Video	290	13.11	3.19
Pooled variances	$t = -1.52$	$df = 379$	$p = .129$
		Sub-test 3B	
Audio(Gp 1)	91	15.01	3.40
Video	290	15.30	3.43
Pooled variances	$t = -.71$	$df = 379$	$p = .478$
		Sub-test 4B	
Audio(Gp 1)	91	16.26	2.59
Video	290	15.77	2.39
Pooled variances	$t = 1.68$	$df = 379$	$p = .094$
		Sub-test 5B	
Audio(Gp 1)	91	13.67	3.70
Video	290	14.31	3.39
Pooled variances	$t = -1.54$	$df = 379$	$p = .126$

We compared mean pre-instruction test scores (Form A) with post-instruction test scores (Form B) to determine the effects of instruction on listening skills as measured by the WBLT. In our first analysis we combined all groups for a total of 475 students. Fewer students were involved in the sub-tests because of lack of sub-scores for Group 2 Audio. There was a significant gain in performance on total score and on all sub-tests except for sub-test 5 which tested the ability to follow instructions and directions using long term listening. See Table 4.

Table 4

Comparison of Mean Pre-instruction Scores with Post-instruction Scores

Test	N	Mean Difference	SD	t	p
Total Score	475	-10.41	9.62	-23.57	.000
Sub-test 1	381	-1.73	4.45	-7.58	.000
Sub-test 2	381	-4.01	3.90	-20.05	.000
Sub-test 3	381	-2.82	4.26	-12.91	.000
Sub-test 4	381	-1.34	3.53	-7.42	.000
Sub-test 5	381	.07	4.00	.36	.720

We compared the total scores of males to those of females for all groups combined and the sub-scores of males to those of females for Group 1 (audio) and Group 3 (video). The results showed that females scored significantly higher on only one sub-test (5) on Form A, and that they scored significantly higher on sub-tests 2 and 3 and on total score on Form B. Although not significantly different, females scored higher than males on all sub-tests and both total scores except for sub-test 3 of Form A where males scored slightly higher than females. Table 5 shovs results obtained on Form A. Table 6 shows results obtained on Form B.

Table 5

Comparison of Male and Female Mean Scores on Form A

Sex	*N*	Mean	*SD*
		Total Score Form A	
Male	183	59.97	9.46
Female	292	61.70	9.84
Pooled variances	$t = 1.90$	$df = 473$	$p = .058$
		Sub-test 1A	
Male	137	10.66	3.29
Female	244	10.96	3.53
Pooled variances	$t = .82$	$df = 379$	$p = .41$
		Sub-test 2A	
Male	137	8.60	2.99
Female	244	9.16	3.06
Pooled variances	$t = 1.74$	$df = 379$	$p = .082$
		Sub-test 3A	
Male	137	12.57	3.90
Female	244	12.33	4.02
Pooled variances	$t = -.57$	$df = 379$	$p = .570$
		Sub-test 4A	
Male	137	14.25	2.96
Female	244	14.71	3.01
Pooled variances	$t = 1.46$	$df = 379$	$p = .147$
		Sub-test 5A	
Male	137	13.62	3.55
Female	244	14.57	3.25
Pooled variances	$t = 2.66$	$df = 379$	$p = .008$

Table 6

Comparison of Male and Female Mean Scores on Form B

Sex	*N*	Mean	*SD*
		Total Score Form B	
Male	183	70.23	10.05
Female	292	72.20	9.40
Pooled variances	$t = 2.17$	$df = 473$	$p = .030$
		Sub-test 1B	
Male	137	12.48	3.86
Female	244	12.63	3.67
Pooled variances	$t = .37$	$df = 379$	$p = .708$
		Sub-test 2B	
Male	137	12.50	3.27
Female	244	13.24	3.13
Pooled variances	$t = 2.18$	$df = 379$	$p = .030$
		Sub-test 3B	
Male	137	14.70	3.59
Female	244	15.53	3.30
Pooled variances	$t = 2.29$	$df = 379$	$p = .023$
		Sub-test 4B	
Male	137	15.72	2.50
Female	244	15.98	2.41
Pooled variances	$t = 1.00$	$df = 379$	$p = .317$
		Sub-test 5B	
Male	137	13.93	3.75
Female	244	14.29	3.31
Pooled variances	$t = .97$	$df = 379$	$p = .333$

We compared the mean scores for males and females in Group 1 (audio with sub-scores). The results showed that when we used an audio version, males scored significantly higher on sub-test 3A (the ability to understand and remember information in lectures using long term listening). With an audio version females scored significantly higher on sub-tests 5A (the ability to follow instructions and directions using long term listening), 1B (the ability to evaluate message content using short term listening), 3B (the ability to understand and remember information in lectures using long term listening), and on total score Form B. See Table 7 for Form A results, and Table 8 for Form B results.

Table 7

Comparison of Mean Scores for Males and Females in Group 1--Form A

Sex	n	Mean	SD
		Total Score Form A	
Male	36	57.17	8.92
Female	55	58.62	9.08
Pooled variances t = .75		df = 89	p = .455
		Sub-test 1A	
Male	36	10.50	3.49
Female	55	10.54	4.16
Pooled variances t = .054		df = 89	p = .957
		Sub-test 2A	
Male	36	8.89	2.87
Female	55	9.16	3.24
Pooled variances t = .413		df = 89	p = .681
		Sub-test 3A	
Males	36	12.83	3.22
Female	55	11.16	3.90
Pooled variances t = -2.14		df = 89	p = .036
		Sub-test 4A	
Male	36	13.11	3.46
Female	55	14.11	2.71
Pooled variances t = 1.54		df = 89	p = .127
		Sub-test 5A	
Male	36	11.72	3.07
Female	55	13.67	3.52
Pooled variances t = 2.72		df = 89	p = .008

Table 8

Comparison of Mean Scores for Males and Females in Group 1--Form B

Sex	*n*	Mean	*SD*
		Total Score Form B	
Male	36	67.28	11.06
Female	55	73.06	10.06
Pooled variances	*t* = 2.58	*df* - 89	*p* = .012
		Sub-test 1B	
Male	36	12.06	4.15
Female	55	13.71	3.47
Pooled variances	*t* = 2.05	*df* = 89	*p* = .043
		Sub-test 2B	
Male	36	12.11	3.34
Female	55	12.80	3.07
Pooled variances	*t* = 1.01	*df* = 89	*p* = .315
		Sub-test 3B	
Male	36	14.06	3.75
Female	55	15.64	3.03
Pooled variances	*t* = 2.21	*df* = 89	*p* = .029
		Sub-test 4B	
Male	36	15.72	2.49
Female	55	16.62	2.61
Pooled variances	*t* = 1.63	*df* = 89	*p* = .106
		Sub-test 5B	
Male	36	12.94	4.04
Female	55	14.14	3.42
Pooled variances	*t* = 1.52	*df* =89	*p* = .012

We also compared the mean scores for males and females in Group 3 (video) and found no significant differences between scores for any of the sub-tests or for the total scores.

We compared the mean scores of Group 3 for the two instructors. There was no significant difference for any of the sub-test scores nor for the total scores for Form A or Form B.

Factor analyses of the sub-tests for Form A and Form B involving all cases showed that the sub-tests were factor pure with an equal amount of variance distributed among the 5 sub-tests in both Form A and Form B. A factor analysis using only the video test scores produced the same outcome as the analysis involving all groups.

To obtain a measure of test reliability, we computed Pearson product-moment correlation coefficients on the video version between sub-test scores and total score on Form A and the corresponding sub-test scores and total score on Form B. The correlations were statistically significant but low. See Table 9.

Table 9

Test Reliability Measured by Correlation of Video Form A with Form B

Test	*r*	*p*
A vs. B total score	0.54	.000
A1 vs. B1	0.23	.000
A2 vs. B2	0.21	.000
A3 vs. B3	0.35	.000
A4 vs. B4	0.16	.005
A5 vs. B5	0.22	.000

n = 290

The Pearson product-moment correlation coefficient between total score for Form A (pre-instruction test) and the gain in total score from Form A to Form B was -.50 (n = 475, p<.000).

Discussion

Our first assumption was that the pilot video version (video) Forms A and B would be easier to administer than the audio version (audio). We did not create a way to test this quantitatively; however, both instructors found that the elimination of test booklets and of the extra sheets of paper made for quicker and easier administration of the WBLT. One problem with the test booklets is having enough copies available. Another problem, and one that takes more time, is in making sure that all booklets are returned. With the video version, we found that we could have all equipment in place when

students arrived. This helped speed up the testing process which is important for classes with 50-minute class periods.

The results confirmed our second assumption which was that students would obtain a higher total score when both audio and visual modalities were used, but only for pre-instruction performance. For post-instruction performance there was no significant difference in the means between the audio and video versions. This difference in modality appears to have an effect only before students receive instruction. One possibility is that when two senses are engaged attention is more focused. The addition of the visual aspect focuses the listener's attention on what is being said and thus screens out irrelevant visual cues. Another possibility for the lack of difference on Form B is that students have gained experience in the test condition itself.

For our third assumption which was that students would obtain higher scores on the video version than on the audio version on sub-tests 1, 2, 3, 4, and 5 for both Form A and Form B, results were mixed. Differences were found only for Form A, sub-tests 4 and 5, with no differences found on any sub-tests for Form B. As with the comparison for total scores, the visual aspect may focus attention better, and some students may benefit more from this focused attention.

The results support our fourth assumption that students completing a course on listening will score higher on Form B on total score and on sub-tests, except for sub-test 5 where a non-significant loss was found. Part 5 tests the ability to follow directions and instructions. We found that 5A was one of the higher scores in Form A for the students we tested, and there was no increase in the score for 5B. The ability tested seemed to be developed at a higher level before instruction, and we may not have done anything to enhance this particular listening skill. Another possibility is that the questions on sub-test 5 of Form B are more difficult.

Our fifth assumption that both audio and video females would obtain higher scores for total score Form A and Form B and on all sub-tests for both Form A and Form B was only partly supported by the results. Females did score higher on all sub-tests and both total scores except for sub-test 3A; however, they did not score significantly higher except for sub-tests 5A, 2B, 3B, and total score on Form B.

Since the combined audio and video did not show the significant differences that we expected between males and females, we analyzed the results for audio separate from video. The results showed that audio males scored significantly higher on sub-test 3A which is the ability to understand and remember information in lectures using long term listening. Audio females scored significantly higher on 5A (the ability to follow instructions and directions using long term listening), 1B (the ability to evaluate message content using short term listening), 3B (the ability to understand and remember

information in lectures using long term listening), and on total score Form B. In comparing video females and males, no significant differences were found for any of the scores; therefore, differences attributable to sex occurred only in the audio version. Apparently, the dual modality video version assists students in responding more successfully and equally on the tests.

After comparing mean scores of Group 3 for the two instructors, we found no significant difference on any of the scores. One instructor is male and one is female, and the female was originally trained by the male for this course. Instructor effects are reduced by both using the same text, many of the same films, videos, exercises, and by similar assignments.

The factor analyses showing five distinct factors for both Forms A and B fully support the Watson-Barker assertion that their test measures five independent factors.

We computed Pearson product-moment correlations to determine the reliability of the test scores. Although we did find statistical significance, the correlations were low. This result probably indicates that the characteristic being measured is not stable over time, and that the tests could be providing an accurate measure of skill proficiency at the time of administration. One explanation for changes in relative performance of the subjects over time is that listening is a skill and that people will gain competence in a skill at different rates. There are several other possible reasons for the low reliability between forms with some factors being environmental and some being related to individual subjects. With the audio version, although warned, some students placed themselves at a distance where they had difficulty hearing because of occasional noises such as hall noise, chair movement, audience vocal noise, etc. which interfered with hearing. With the video version, although warned, some people placed themselves where they had difficulty seeing the test items requiring temporary halting of the testing procedure so people could move. For individuals, potential causes include some subjects having colds, headaches, upset stomachs, excessive fatigue, mild emotional worries, test anxiety, and other problems, all of which could interfere with individual test results.

Still another explanation for low reliability and the negative correlation between total score on Form A and gain in total score following instruction is that subjects who scored relatively high on the pre-instruction test (Form A) tended to show less gain on the post-instruction test (Form B). Conversely, subjects who scored relatively low tended to show more relative gain.

We are pleased with the video version of the Watson-Barker Listening Test. As teachers, the test gives us a starting point for a discussion with students regarding their current level of listening skills. The test also provides the students with an experiential view demonstrating that there are different kinds of listening, and that each kind requires specific skills. Students seem to like the test

and seem to be more receptive to skill development after they have the opportunity to evaluate their current level of performance and get past the barrier of thinking they are good listeners--especially when they want to be good listeners.

Future research should address the issue of reliability and why the correlations are low. One way to do this would be to use Form B first and then Form A. Also, more research could focus on the time allotted between administration of the two forms and the difference between giving the tests on the same day, a day apart, a week apart, two weeks apart, and at the start and end of a quarter or semester.

Other research might focus on the student's year in college and differences between scores for freshmen, sophomores, juniors, and seniors.

A final recommendation would be to see if there is a correlation between test scores and grade for the course (especially listening courses).

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